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ROCKS and MINERALS

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A Magazine for Mineralogists, Geologists and Collectors

Official Journal of the Rocks and Minerals Association

July, 1941

Vol. 16, No. 7 25c Whole No. 120

THE ROCKS AND MINERALS ASSOCIATION

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Organized in 1928 for the increase and dissemination of mineralogic knowledge

To stimulate public interest in geology and mineralogy and to endeavor to have courses in these subjects introduced in the curricula of the public school systems; to revive a general interest in minerals and mineral collecting; to instruct beginners as to how a collection can be made and cared for; to keep an accurate and permanent record of all mineral localities and minerals found there and to print same for distribution; to encourage the search for new minerals that have not yet been discovered; and to endeavor to secure the practical conservation of mineral localities and unusual rock formations.

Ever since its foundation in 1928, the Rocks and Minerals Association has done much to promote the interest in mineralogy. It has sponsored outings, expeditions, formations of mineralogical clubs and the printing of many articles that have been a distinct contribution to mineralogy.

Those of our readers who are members of the Association can rightly feel that they too were sponsors of these many achievements that have helped to give mineralogy a national recognition. Among your frineds there must be many who would like to have a part in the Association's work—to share with you the personal satisfaction, the pleasure, and the benefits of membership. Will you give your friends this opportunity to join the Association by nominating them for membership?

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Affiliation with the world's largest mineralogical society cannot fail to increase membership, enlarge circles of acquaintanceship, and stimulate a keener interest in mineralogy.

A list of affiliated clubs will be found among the back pages of the magazine.

Rocks and Minerals

PUBLISHED MONTHLY

Edited and Published by PETER ZODAC

July 1941

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ROCKS and MINERALS PEEKSKILL, N. Y., U. S. A.

The Official Journal of the Rocks and Minerals Association

Chips From The Quarry

A DEALER'S VEWPOINT OF COLLECTORS

We have recently had a letter from one of our advertisers, a large dealer in mineral specimens, who feels that the mineral dealer does not get quite the consideration due him from the collector. We quote a part of his letter:

"We poor dealers will have to cut down to two meals a day unless you print some strong editorials suggesting to your readers that they, when out field collecting, should call on mineral dealers to enjoy the pleasure of browsing through their stocks, viewing the displays, and purchasing a fine specimen or two. It is rapidly getting to the point where mineral hobbyists either pass up the dealer entirely or merely use him as an information bureau for local collecting trips. You would be surprised at the number of middle western and eastern amateur collectors who call here during the summer to inquire—"How can I get to the quartz crystal locality?" or "Where is the best place to collect moss agate and petrified wood?" We have all this material in endless array yet it never occurs to them to even look at it a few times, so obsessed are they with the idea of collecting them in the field free of charge. If one-third the effort given by mineral magazines to publicizing field collecting were given to playing up the desirability and pleasure and profit of developing collection through the medium of dealers, there would be some real future in this business for the dealers and the magazines, too. The way the dealers are ignored and the free field collecting played up, I would think the mineral magazines would feel justified in expecting their army of readers to reciprocate by filling up 10 or 15 pages with classified ads offering their duplicates, exchanges, trades, etc., but how many of them would ever think of spending a few dollars with you for advertising. Furthermore, new converts entering this hobby are immediately educated to believe that this is one hobby that will not cost them one red cent in cash money—that as they ride around the country in their cars they can pick up all the beautiful mineral specimens in the field, themselves, entirely free of charge, like the old rag and iron men of the days gone by. All these collectors get is junk, mostly, as you know.

"Summing up, the dealers are really entitled to a little more boosting than they are getting at present from mineral magazines, and I do hope you will try to work out something along this line running continually in your magazine along with your articles on field collecting. A great many field collecting articles should end up with the suggestion that after visiting localities, noting the geology, and possibly taking some pictures, the collectors should visit some of the local mineral dealers to purchase typical specimens of good quality at reasonable prices to have something they can really be proud of."

We quite agree with much that was

(*Continued on page* 264)

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The Official Journal of the ROCKS and MINERALS ASSOCIATION

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THE GEOLOGY OF THE LINCOLN TUNNEL

PART 4

By THOMAS W. FLUHR

The Under-River Section.

The shields from the New Jersey shaft were shoved blind through the river silt until they reached the caissons or river shafts at the Manhattan side of the river.

The silt found in the journey across the river was of one general type; a dark gray, clayey, plastic silt; never sandy except close to the rock floor. As stated the shields were bulkheaded except for two hydraulically-operated doors for taking in the silt. The silt squeezed in through these partly opened doors as a ribbon, expanding as it came in. This expansion of the silt had been noticed previously when exploratory borings were being made. At that time undisturbed samples of silt were secured from various depths. Those which were taken at depths of 100 to 120 feet showed this expansion. When the sampling spoon was driven down into the silt, at that depth it behaved like rubber. The spoon could not be pulled up directly for the sample would adhere to the bottom and be pulled partly out of the spoon. It was necessary to twist the spoon so as to break off the sample from the bottom. The sample was taken in a brass cylinder, and on being brought to the surface the cylinder was capped and sealed with paraffine so as to preserve the sample in its original condition. Samples taken from depth expanded, pushing off the caps from the cylinders and losing water. The silt coming in through the doors of the shields acted in the same manner, expanding after it entered so that the ribbon of silt was thicker than the opening through which it came. In the case of the south tube, the first constructed, the air pressure was maintained at about 17 pounds per square inch, which is far below the theoretical air pressure necessary to balance the hydrostatic head of the water. Despite the low air pressure used the material did not run in rapidly but squeezed in like plastic clay. In constructing the south tube approximately 25% of the silt was allowed to enter the tunnel while 75% was displaced and pushed aside by the shield. The north tube was driven after the south tube had been completed and lined. The tunnels are only 75 feet apart center-to-center leaving a width of only 44 feet of silt between them. Displacement of too great a quantity of silt in drivng the north tube would have displaced the previously constructed south tube. To avoid this it was necessary to take in a much greater amount of silt than in the case of the south tube, and to displace less, and to make this possible it was essential to reduce the air pressure to a low value so that the silt would be sufficientiy fluid to flow easily through the doors. The silt taken into the tunnels was allowed to remain until the tunnel had been completed. The weight of this silt tended to counterbalance the tendency of the tunnel to rise, and the silt was removed in free air later, a much less costly operation. Most people do not realize that a compressed air tunnel such as this is like a boat, being lighter than the material through which it passes, and that in a semi-fluid mass such as that of the Hudson River silt there is a tendency for the tunnel to float rather than to sink. The

heavy iron lining and the inner concrete lining provide weight to counterbalance this tendency.

Close to the New Jersey shore the river silt carried many shells, but this very fossiliferous layer soon gave way to a silt with fewer shells. In addition to the shells there were many clay concretions. Among the shells the following forms were identified: Natica, Nassa, Ostrea, Sycotypus, Urosalpinx. These are all recent in age. Besides these large shells, there were numbers of Foraminifera, Ostracodes and Diatoms.

The New York River Shafts.

These were sunk as pneumatic caissons outside the Manhattan bulkhead line in the Hudson River. They were large steel boxes, reinforced by internal structural steel members, and lined with concrete. A working chamber and cutting edge were at the bottom. On opposite sides of each caisson were rings and circular openings, temporarily covered, into which the shields coming from east and west were guided. The caissons thus acted as junction boxes for connecting the tunnels from New Jersey with those coming from the construction shafts farther east in Manhattan, thus obviating the need for making difficult connections between the shields somewhere out under the river.

Prior to excavating an elaborate program of test borings was carried on at the sites for the river shafts.

The caisson for the south tube was sunk first and the caisson for the north tube later. The bulkhead situated east of the south caisson and only a few feet away was a concrete structure resting on wood piles which had been driven down through the river silt to the bedrock. The land east of this bulkhead is made ground which had been recovered from the river by the deposition of artificial fill which was laid down on the silts underlying that part of the river. Some of the material used as fill consisted of huge blocks of rock taken from subway excavations. This heavy fill had settled, pushing aside the soft river silt, which moved out toward the river, carrying with it the bulkhead, piles and all. In places this concrete bulkhead was fractured and displaced some four feet. Much concern was felt, lest the caisson excavation, by disturbing the silt, might cause further displacement. An elaborate system of ties was used to anchor the bulkhead, but fortunately no further displacement occurred.

Details of the South River Shaft.

For most of its depth this passed through Hudson River silt. This silt was a dark gray clayey silt with occasional shells. The only signs of stratification were a few horizontal layers of brown peaty vegetable matter. A few unusual cylindrical aggregates of shells were found. Immediately over the rock floor occasional boulders were found in the silt. The only glacial deposit found was in a small pocket or depression in the rock floor on the southeast side of the caisson and consisted of reddish-brown sand and clay with rounded pebbles and showing no stratification.

Rock was first encountered at the south corner of the caisson at elevation 219.0, eighty-one feet below the river surface.[1] There was practically no disintegrated rock present and the rounded and smoothed off ridges indicated that glacial ice had scraped away any loose or weathered material. Most of the rock is a biotite schist with coarse mica flakes, with regular foliation structure. The strike of the foliation varies from N15°E to N20°E and the dip from 65°NW to 80°NW. The schist is intruded by several pegmatite bands which run parallel to the foliation. These are quartzose aplitic pegmatites carrying white mica and often smoky quartz. The largest of these pegmatites extended along the southeast and part of the northeast sides of the caisson. On the northeast side of the caisson the pegmatite just described

1 If sea level is considered zero, then engineers who do work that is partly below and partly above sea level will have plus elevations and also minus elevations. This leads to confusion and blunder. To avoid this, engineers in New York City who work on tunnel and subway jobs refer to mean high water as 300.00. Since mean high water is appproximately 2.6 feet above mean sea level, then zero elevation is approximately 297.4 feet below mean sea level. Thus all elevations are plus: there are no minus elevations to confuse with the plus. All drawings have a notation: "Elevations referred to mean high water=300.0 which is 2.653 feet above mean sea level at Sandy Hook." Thus the elevation 219.0 is 81 feet below mean high water.

was cut by a later coarser-grained pegmatite dike about 14 inches wide, with salmon-colored feldspar. The older aplitic pegmatite near the sides of the later dike is strongly foliated, with this structure paralleling the dike. Jointing is not very prominent in the schist but common in the pegmatite.

Details of the North River Shaft.

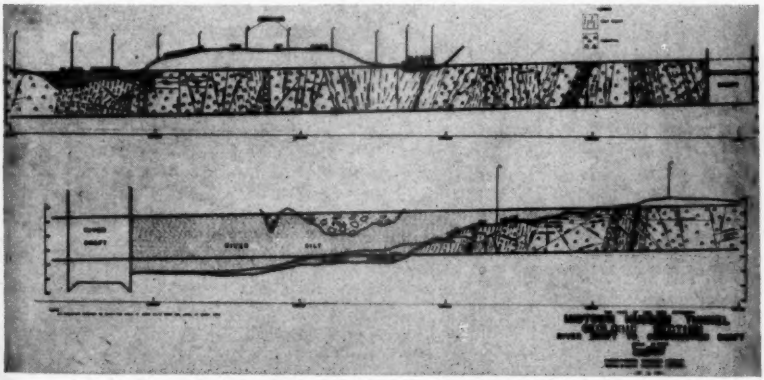
This was sunk in 1937, two years after the south shaft had been sunk. Sixteen test borings were made at the site of this shaft, penetrating to a depth of 10 feet into the bedrock. On excavation the overburden was found to be the Hudson River silt. The upper part was practically a mud. In the lower part were horizontal laminae of dark gray silt ¼" to ¾" thick separated by thin 1/16" streaks of dark brown peaty material. The silt carried small clam shells and shell fragments. Close to the rock floor the silt become a little sandy. No boulders were found in the silt above the bedrock, and no glacial material was found. The rock floor had been smoothed by glacial ice and scraped clean of all weathered material.

Most of the rock was found to be a gray aplitic pegmatite, an igneous member intrusive into the Manhattan schist. This rock is made up of quartz, feldspar, muscovite and occasional biotite and garnet, and varies in grain size from a sugary texture to medium grain, and in composition from an aplite to a granite. Where coarse, some of the feldspar has a pinkish color and has typical pegmatite appearance. A small amount of biotite schist was found in the southwest corner. Two pegmatite dikes cut the aplitic rock, the larger of these being 1' to 2' wide. The rock exhibited a few joints which were tight and not decayed, nor was the jointing sufficiently extensive to weaken the rock.

New York River Shaft to Construction Shaft—South Tube.

Excavation in rock was begun at the construction shaft near 11th Avenue, Manhattan, and carried toward the New York River Shaft. Borings had been made previous to the start of work for the purpose of determining the elevation of the rock floor and these were supplemented by additional borings made after construction was begun. A full size tunnel was excavated until approach to the downsloping rock floor made such excavation impracticable. A bottom drift was then begun and carried as close to the limits of the soft ground as possible. After setting up a shield and bulkhead the bottom drift was then carried out from the rock into the overburden by the aid of compressed air. The purpose of excavating this bottom drift is to permit construction of a concrete cradle for the shield, thus protecting it in traversing the rock section, and also to perform as much excavation as possible in free air.

The bedrock, belonging to the Man-



Geology—New York River Shaft to Construction Shaft.

hattan schist formation, is mostly a biotite schist with a little associated biotite-muscovite schist, heavily intruded with aplitic pegmatite. This aplitic pegmatite is for the most part a fine-grained gray rock, in places becoming a coarse pegmatite, in which case it often shows pinkish or salman colored feldspar and smoky quartz. Some of the coarser pegmatite may have been of somewhat later origin than the fine grained aplitic type although the relation is not clear in the tunnel. Where the aplite is adjacent to schist rich in biotite it was noticed that the aplite also carried biotite, and where adjacent to garnetiferous schist the aplite also carried garnet, and similarly in the case of muscovite. This suggests that the aplite acted as a replacing agent in its manner of intrusion, retaining some of the minerals of the preexisting schist.

Most of the aplitic pegmatite follows closely the foliation structure of the schist. In a few places, notably near Station 230+50 and 229+40 on the south wall of the tunnel and near Station 229+25 on the north wall, cross-cutting contacts were observed, clearly indicating the intrusive structural relation of the pegmatite to the schist.[2]

In the vicinity of Station 229+00 the rock floor showed pronounced jointing and carried water. The rock floor immediately to the west is depressed below the top of the tunnel and the shield encountered glacial sand with pebbles at this point. Between Stations 226+91 and 226+16 there was another depression in the rock floor filled with glacial till overlain with laminated micaceous reddish-brown sandy silt.

At Station 225+14 the rock floor again dropped off in elevation and river silt was encountered. Between Stations 226+70 and 222+76 artificial fill was found, made up of pieces of rock and miscellaneous rubbish which had been used to build up this area at the surface as the fill continued to sink into the river silt below. This reached a depth of 65 feet below the surface.

At Station 223+92 glacial drift was again encountered in the tunnel between the rock floor and the river silt. This material was reddish-brown sand with a little clay and gravel and occasional boulders, and showed no stratification. Being pervious and water-bearing additional air pressure was required to keep the material from running in when first encountered in the bottom drift.

The New York Construction Shaft—South Tube.

Bedrock was well exposed in the New York construction shaft and certain unusual features apeared. The predominating variety of rock is biotite schist. Some of it carried muscovite, and pyrite was a common accessory. The formation has been heavily intruded by pegmatite. The general strike of the foliation is N20°E and the dip 60° to 70°SE but many variations in the strike and dip were recorded and some of the rock was folded and contorted to a high degree. Shearing and jointing accompanied by decay weakened the rock, which proved to be rather soft when excavated, but nevertheless stood well without support. The most unusual feature was a steeply dipping almost vertical horseshoe fold in the schist, marked by a pegmatitic intrusion. Excavation of the shaft has served to bring out and emphasize the extremely variable nature of the rock, its close folding, abundant jointing and the irregular form of the pegmatite intrusions.

Adjacent to and connected with this construction shaft a ventilation shaft was excavated, over which the New York land ventilation building was erected. On the northwest side of the shaft was found biotite schist, with aplitic pegmatite on the southeast side. Where the pegmatite and schist were in contact, weathering and erosion had developed a depression in the rock floor. At first this depression was believed to indicate faulting but on further excavation no fault was found. The pegmatitic invasion had evidently developed a mixed rock less resistant to erosion than the ordinary schist. The pegmatite carried xenolithic inclusions of biotite schist, some of them dragged out and contorted. Jointing was more prominent

2 The point which marks the beginning of the survey line, Sta.0+00, for the center line of the Lincoln Tunnel is over in the Jersey meadows at the beginning of the work. The highest numbered station, which is at the New York Plaza, marks the limit of the survey line of the work.

in the pegmatite than in the schist, four systems of master joints being present.

Rock Tunnel and Open Cut.—Ventilation Shaft to New York Plaza—South Tube.

Part of this ground was tunneled and part excavated by open cut methods, as indicated on the geologic section. The rock is a biotite schist carrying intrusions of aplitic pegmatite. The intrusive nature of the pegmatite was shown in numerous places where it cut across the foliation of the schist. Most of the rock stood up well both in the tunnel and open cut sections. The only place giving trouble was the section immediately adjacent to the ventilation shaft where the pegmatite proved to be excessively jointed and blocky.

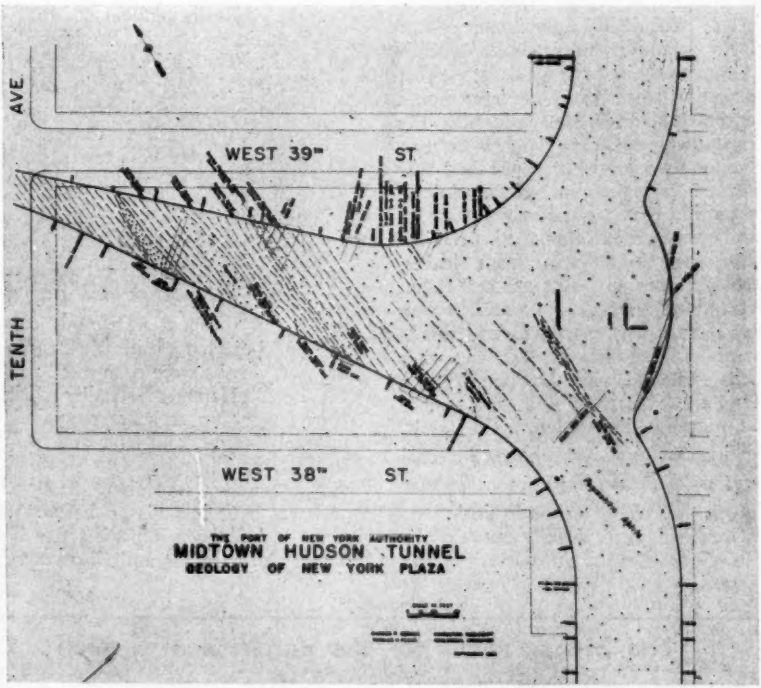
The New York Plaza.

This was a large open cut excavation. As in the tunnel, the rock is a biotite schist intruded and in places literally soaked with aplitic pegmatite. The unusual feature is the large amount of aplite in the area. In the central part of the cut some of the Manhattan schist was injected and recrystallized so as to resemble a gneiss.

This aplite is part of an extensive intrusion of granitic type which occurs on the west side of Manhattan extending from near 23rd St. to the vicinity of 59th St. The intrusion comes up irregularly through the schist and carries inclusions and roof pendants of schist. It appears to be limited in area to the area between Ninth Avenue and the Hudson River.

In gathering geological data during the course of this project the writer was accorded a high degree of cooperation by the engineering field organization of the Port Authority, directed by Resident Engineers Mechanic, Darrow, Crandall and Lincoln.

Dated December 1, 1940.



Geology of the New York Plaza

A FOSSIL HUNT

By ROY S. McINTOSH

In conformity with the tradition that Rocks and Minerals Association members should have an annual outing, three car-loads of Junior Mineral League members of Morgan Park Junior College, Chicago, Illinois, started for the fossil beds of Northern Illinois on the morning of May 18th. Some of the best hunting grounds in the world for fossils of the Carboniferous Age are southwest of Chicago on Route 66 at the old strip "ruins" of the Northern Illinois Coal Corporation in the Mazon Creek Basin. At a large sign bearing that inscription, we turned to the right off Route 66. A mile or so west brought us to the locality where we were not disappointed.

A cross section of the stratification of this region shows: first, about 40 feet of glacial till largely composed of clay and boulders and pebbles; next, a stratum of white to gray sandstone that has been planed off by glaciers; then a stratum of sandy clay in which the fossils lie; and next, a 4 foot blanket of bituminous coal. It would seem that the last vegetation got caught in the deposition of sand and clay and could not become coal carbon. Perhaps juices and other ingredients from leaves, stems, spore-pods, etc., of the fallen vegetation affected the surrounding clay in such a way as to make it harder, and the result was oval, enclosing rocks which, when tapped lightly along the edges, will split and expose the vegetable impression. The fossil-bearing stratum just above the coal was stripped off and thrown by the shovels uppermost on the "ruins".

Climbing over these mountain-like hills, the League members found many very good looking prospects. Armed with the excellent monograph, *Pennsylvania Flora of Northern Illinois*, by A. C. Noe, 1925, (Bulletin 52 of the Illinois Geological Publications, Urbana, Illinois), it was easy to identify most of the finds. Good specimens of nearly all the principal groups of pteridophytes were found—ferns, calamites, and lycopods—both the sigillaria and lepidodendron. No very good specimens of sphenophyllum were found on this trip. Sphenophylla are scarcer though at times some very fine examples of fossil impressions of this vine-like vegetation with its slender stem and wedge-shaped leaves will come to light. It was interesting to note that underfoot in the wet sandy soil, horsetail weeds were springing up, the lowly descendents of the very fossil-plants we were breaking from the rocks. The ancient equisetales differed more in size than in character from the present equisetum or horsetail or scouring rush of today. Some of the fossils were half turned to coal and showed bright colored resinous-like splotches.

At 1:00 p.m. our party went to a roadhouse and oil station to eat lunch, talk over our finds, and lay out a campaign for the rest of the day. The afternoon was spent a little farther east on the "ruins" opposite the large coal breaker. Fossils were even more plentiful here. Hammers steadily clicked, shouts went up at some new find of unusual interest, and bags and baskets steadily grew heavier. Our small caravan got under way about 3:30 p.m. and was back in Chicago before 5:00 p.m. It had been a perfect day both by way of weather and discovery.

The Money spent for the purchase of a good mineral specimen is a good investment.

MINERALS OF THE BUTTE DISTRICT, MONTANA

By PETER A. SMITH

Placer gold was discovered in Butte in 1864 and the first silver vein the next year. In a few years Butte was a prosperous silver mining camp. Copper had been noticed from the first, yet very little interest was taken in it because the selling price of the base metal would not pay the high cost of transportation as there were then no railroads. It was not until 1875 that any systematic development of copper took place. In 1880 there was a marked increase of production amounting to one million pounds, and by 1882 after the completion of the first railroad in December, 1881, the yield was nine million pounds. Since 1886 the Butte mines have annually yielded more copper than any other single district in the world. Butte Hill is locally called the richest hill on earth.

The Butte district covers a range of steep smooth hills, sloping south and east, at an altitude from 5,500 to 5,800 feet above sea level. The mining area is about five miles square. The ore deposits occur in a definite zonal arrangement. The copper producing area, two by three miles, occupies the southern and central part. The adjoining zone contains principally zinc and some lead although mixtures of zinc and copper minerals occur at the edge of the copper area. The outer zone is highly siliceous and contains silver, zinc, manganese but practically no copper (see under chalcopyrite). All three zones contain silver, but there is more of it per ton in the outer zone than in the copper area, especially to the north and west sides.

The deepest mines are 3,900 feet deep. The Anaconda Copper Mining Company has three of these mines equipped with 4,500 h.p. electric hoists, capable of operation to a depth of 5,000 feet.

A large number of mines are in the district some of which are mentioned with the minerals.

Parts of the mines have been on fire for over 40 years. These fire areas are walled off with concrete and slime made by mixing tailings from the zinc concentrator with water is pumped into these

areas to put out the fire. The copper in the fire areas is not lost as the water leaches it out as copper sulphate. The water containing copper sulphate is pumped to the surface where it is run over scrap iron which precipitates the copper. This is a unique sight for tourists who do not understand chemistry to see iron apparently change to copper. The Anaconda Copper Mining Co. obtains over 6,000,000 pounds of copper a year in this way.

The writer has heard his grandfaather tell how in the early days the copper ore was piled in large beds and set afire to roast it. After once being set afire it would burn without further fuel being added. The smoke would be so dense that one could not see across the street. The fumes from the copper minerals, which included the arsenic mineral, enargite, killed off the vegetation for miles around.

LOCATION

Butte, a city of about 50,000 population of whom 10,000 work in the mines,[1] is located in the northeastern part of Silver Bow County which county is in the southwestern part of the state. It is the largest city in Montana.

GEOLOGY

Five types of rocks—granite (quartz monzonite), aplite, quartz (aplite) porphyry, andesite, and late rhyolite porphyry

1 *Butte Mining District, Montana,* by Eugene S. Perry, XVI Int. Geol. Cong. Guidebook 23, Washington, D. C., 1933, p. 1

—are found in the immediate vicinity of Butte, and lamprophyric dikes occur in outlying areas.[2]

The ore deposits occur in the granite (quartz monzonite) of the Boulder batholith as replacement and fillings of a fissure vein system. The veins dip at a steep angle.

MINERALOGY

One of the most interesting features of the Butte District is its large array of minerals of which the principal copper ores are chalcocite, bornite and enargite with minor amounts of chalcopyrite, tennantite and covellite.

In compiling the following list, a large number of specimens were collected and examined. All available printed reports were also examined and the writer has quoted freely from one important report: *Geology and Ore Deposits of the Butte District, Montana,* by Walter Harvey Weed, U. S. Geol. Sur. Prof. Paper 74, Washington, D. C., 1912. Furthermore, to assure the accuracy of the list and to bring it up-to-date, a copy of it was sent to Mr. M. H. Gidel, Assistant Chief Geologist of the Anaconda Copper Mining Co., Butte, who very kindly gave it his personal attention. The writer is deeply indebted to Mr. Gidel for his critical examination of the list and for his many notes among which copiapite, jarosite, nontronite, pearcite, and thuringite were new additions. We believe, therefore, that this is the most complete list of the minerals of the Butte District and it should be of much interest and value to collectors.

The minerals of the Butte District are:

Albite: White, as a constituent of granite.

Amphibole, var.Hornblende: Occurs as irregular black grains in quartz monzonite and as dark green grains in granite.

Ankerite: Often found in veins or veinlets near or in zinc-bearing veins, particularly in the silver-zinc and outlying portions of the district. (Gidel).

Apatite: Noted as small grains in quartz monzonite.

Argentite: It is very common in the silver veins of Walkerville. Wonderful masses and crystallized specimens were obtained. All of the crystallized specimens that the writer has seen were trapezohedrons except one. The largest crystal seen, a trapezohedron, measured 5/8 inch.

Azurite: Occurs sparingly in the surface or oxidized zone of copper outcrops.

Barite: Found in small amounts in the copper veins; also in the Emma mine as light yellow crystals, up to 3/8 of an inch in length, on rhodochrosite. Weed reports, (p. 84): "Barite occurs only in the fault veins. It has been noted in fine crystals of a clear yellowish-brown color and tabular form lining vugs in the Blue vein and cavities in the veins of the Leonard mine. It occurs incrusting all the other minerals characteristic of the vein and seems extremely recent. Its occurrence is limited to vugs and water channels."

Barite is also found in fissure veins. (Gidel)

Biotite: Occurs as small black flakes in quartz monzonite.

Bornite: A very common mineral in the copper zone but rarely found in pure masses, generally in so-called intergrowths with chalcocite and chalcopyrite. Very rarely found crystallized. Crystals have been found in the Anselmo mine. The largest crystals seen, 5 millimeters in length, were a number of cube-octahedrons on a lean ore specimen. Crystals were also seen associated with rhodochrosite crystals.

Bornite, tarnished and massive, associated with chalcocite, makes very showy specimens.

Brochantite: Have noticed brochantite as a post-mine mineral only, deep green efflorescent crusts with other sulphate minerals of copper and iron. (Gidel).

Calcite: Dogtooth crystals, an inch or more in length, have been found in the Little Mina and other mines. It is found in most of the mines but only occasionally and in small amounts.

Cassiterite: Found in the Mountain View and other mines at Butte. (U. S. G. S. Bull. 624, p. 180).

Very rare (Gidel).

2 Perry, work cited, p. 5

Cerargyrite: Commonly associated with pyrite in oxidized portions of silver-bearing veins. Also forms thin black coatings on minerals.

Cerussite: Reported by Harter[3] as associated with galena. Rare.

Chalchanthite: Found in beautiful greenish-blue stalactites in old workings. It also forms crusts or crystalline tufts on mine timbers and wall rocks. It coats rock fragments in old stopes, in some mines so abundantly that it has been found profitable to collect them from time to time. In the Silverbow mine pure chalchantite is so abundant as to almost fill some of the old drifts. (Weed, p. 81).

Chalcocite: The most abundant copper mineral of the Butte District. It occurs filling crevices and cementing a breccia composed of fragments of enargite and of earlier quartz-pyrite veins. It envelopes and incloses well formed and large quartz crystals; it cuts pyrite grains and also fills fractures in bornite and in pyrite and therefore is certainly the latest ore mineral formed and is in large part a replacement of pyrite. (Weed, p. 75).

It also occurs in large pure masses and as intergrowths with bornite. It is rarely found crystallized. The largest crystal seen was a crystal portion 2 x 2 inches in size; it was also noted as small brilliant crystals on pyrite and quartz. It sometimes replaces covellite. A covellite crystal was seen, ¾ x 1 inch in size, that was completely replaced by chalcocite. Another very interesting specimen, from the Badger mine, consisted of chalcocite crystals that were partially replaced by bornite; the specimen was 1 x 1½ inches in size and was supposed to have come from the 2,800 foot level of the mine.

The following pseudomorphs from Butte are on display in the American Museum of Natural History, New York City: Chalcocite after covellite, a loose crystal; chalcocite after a large aggregate of well-formed covellite crystals; chalcocite after sphalerite (a group of large complexly developed sphalerite crystals with surface striations and etch pits sharply preserved by the chalcocite).[4]

Chalcopyrite: It is wide spread in the Butte district but found only in small amounts in comparison to the other copper minerals. It usually occurs with bornite. Chalcopyrite and tetrahedrite are the only copper minerals found in the silver zone. It sometimes occurs crystallized with smoky quartz and rock crystals.

Chlorite: Occurs as an alteration product of biotite in granite. (Gidel).

Chrysocolla: Occurs as a light, extremely porous, corklike material of a bright-green color. (Weed, p. 81). Found in the Butte Duluth, and Bullwhacker mines. (Gidel).

Colusite: This rare mineral containing tin is found in the copper veins of Meaderville.[5] It has a bronze color and occurs massive and disseminated in quartz. Crystals are very rare and of the few found the largest measured 5 millimeters. (Sometimes found with hubnerite. Gidel).

Copiapite: Mushroom-like efflorescences, white to brownish-white, which form as crusts in old mine working;it is a basic iron sulphate. (Gidel).

Copper: It is rare in the Butte district. It has been found in the oxidized zone of the copper veins in the Tropic Mine. In the Bell mine it occurs as dendrites. Most interesting specimens found in the old mine workings are mine timbers replaced by native copper. Generally the copper occurs as stringers and as fine shot in the wood but sometimes as pure masses.

Covellite: At one time covellite was common in a few of the mines but it is now a rare mineral. It is generally associated with enargite and chalcocite. Beautiful crystalline specimens were obtained and more rarely crystals were

3 Harter, R. F. H. *Some notes on the Butte, Mont., District.* ROCKS AND MINERALS, Sept., 1928, p. 80

4 *Catalogue of Mineral Pseudomorphs in the American Museum,* by Clifford Frondel. Bull. of the Am. Mus. of Nat. Hist., Vol. LXVII, 1935, New York, pp. 407-408

5 *Colusite—its occurrence, paragenesis and genetic significance,* by Raymond Nelson. Am. Min., Vol. 24, June, 1939, p. 369

found. The crystals occurred as thin hexagonal plates and as books of crystals. Quite often the crystals have a thin coating of pyrite; crystals of covellite have sometimes been replaced by chalcocite.

Cuprite: This dark red oxide of copper occurs sparingly and is not important commercially. It is sometimes associated with native copper.

Cuproplumbite: A massive mineral resembling galena. (Dana's *System of Mineralogy,* 6th Ed., John Wiley & Sons, Inc., New York, 1st App., p. 21).

Dolomite: Associated with ankerite and mangano-calcite. (Gidel).

Electrum: Rare occurrences in small veins in southwest portion of district. (Gidel).

Enargite: An important ore of copper and arsenic in the Butte mines. It is generally found in crystalline masses in the copper zone and it is not uncommon to find it in druses of small crystals. Enargite occasionally is found in beautiful large crystallized specimens, as striated prisms up to 1 and 1½ inches long. It is common to find enargite crystals replaced by chalcopyrite, also tennantite leaving hollow crystals.

Enargite pseudomorph after hubnerite have been observed in the Leonard mine. (Weed, p. 78).

Epidote: Found in rhyolite porphyry. (Weed, p. 41). Rare.

Fluorite: Occurs in small amounts in the copper and zinc veins, most notable in the Elm Orlu and Badger mines. In the Elm Orlu it is associated with rhodochrosite. In the Badger mine the fluorite is purple and green in color. The purple forms cubes with octahedron modifications and the green as octahedrons.

Galena: A common mineral associated with sphalerite in varying amounts. Rarely found crystallized. Mined in the Emma and Orphan Girl mines with sphalerite.

Gold: Occurs native as placer gold and in the copper and silver veins. In the copper ore it occurs at a value of about 18c per ton of ore. Very rarely native gold is found in vugs of chalcocite.

Goslarite: Is extremely common in old workings where it forms white efflorescent coating of long and delicate hair-like needles on walls, air pipes, and other exposed surfaces. (Weed, p. 82).

Gypsum: Occurs as white crusts and incrustations in old mine workings and on mine dumps. (Weed, p. 83).

Helvite: It is rarely found as small yellowish masses up to 2 and 3 millimeters in size, in rhodonite, in the Lexington, Moulton, and Alice mines;[6] also in the Goldsmith mine, in rhodonite.

Hematite: Found in veins at two localities only—rare. (Gidel).

Hubnerite: Relatively rare but found occasionally in the copper veins as small crystals with drusy quartz in vugs.

Jarosite: Yellowish, micro crystalline films in joints and cracks in vein outcrops. (Gidel).

Kaolin: Common in the weathered zones of altered rocks of Butte. It occurs also in the veins and as a constant associate of secondary chalcocite, particularly in crystals lining vugs in the veins. (Weed, p. 83).

Klaprotholite: Found microscopically as an intergrowth with covellite. (Geological Survey Bulletin 825, pages 76 and 85).

Limonite: Occurs in the oxidized zone of the veins usually with some manganese oxide minerals. Also common as stalactites in old working—this latter is limnite, the beginning of limonite. (Gidel).

Magnetite: A common constituent in minor percentage of the Butte quartz monzonite, occurring in irregular grains and poorly formed crystals. It has been observed interlocked with pyrite, the two together forming an irregular crystal. It has not been observed in the veins. (Weed, p. 83).

Malachite: Occurs sparingly in the oxidized zones of copper veins. Also noted as minute needle-like crystals, filling cavities in manganese oxides. (Weed, p. 254).

Manganite: Occurs with psilomelane and wad. (Gidel).

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6 *Helvite from the Butte district, Montana,* by D. F. Hewett, Am. Min., Vol 22, June, 1937, p. 803

Marcasite: Is relatively rare in the Butte mines. It is found admixed with pyrite on upper levels and also in aggregates of imperfect crystals lining vugs and generally associated with kaolin. (Weed, p. 74).

Molybdenite: Not an uncommon mineral in the Butte district but found in small amounts in the copper veins and in pegmatites. A ¾ inch crystal was seen from a silver mine in Walkerville.

Muscovite: In large flakes in altered granite at the Gem mine. (Weed, p. 189).

Muscovite, var.Sericite: Sericite, the finely felted form of muscovite, is the most abundant mineral of the altered rocks, not only in the vein walls but also in the gangue of the enargite veins. (Weed, p. 83).

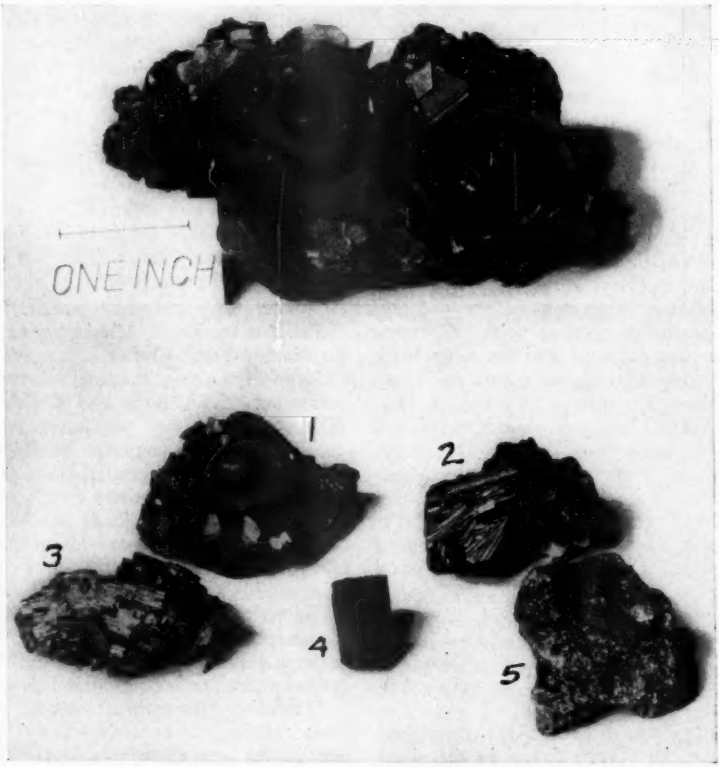
Nontronite: Yellowish-brown type of kaolin—sometimes found as coatings. (Gidel).

Opal: In masses of so-called silicified granite found about many of the vein outcrops. (Weed, p. 83). Also in veinlets in rhyolite in the Big Butte area. (Gidel).

Orthoclase: Pinkish, as a constituent of quartz monzonite.

Pearcite: See polybasite.

Pisanite: This mineral, commonly regarded as a mixture of copper and iron sulphates, is common in many of the un-



Top: Group of Covellite crystals from an old Butte collection.
Bottom: 1—Enargite crystals. 2—Covellite crystals. 3—Parallel groupings of enargite crystals. 4—Enargite crystal ¾ inch long. 5—Stephanite (crystal portion).

worked drifts of the mines where seepage waters come down through old stopes and carry both copper and iron sulphides in solution. It usually occurs in stalactites and crusts in old drifts. (Weed, p. 82).

Polybasite: Found with other silver minerals, including pearcite, rhodochrosite, and rhodonite in the old Star West Mine. (Gidel).

Proustite: (Light ruby silver). Occurs as a primary ore and in tetrahedrite.

Proustite and argentite have been found as tiny red and black specks in quartz. (Weed, p. 248).

Psilomelane: Common in massive botryoidal forms. An oxidation product of rhodonite and rhodochrosite.

Pyrargyrite: (Dark ruby silver) Occurs as a primary ore and with tetrahedrite. Crystals have been found in fractures of altered granite. Weed, p. 80).

Pyrite: The most common metallic mineral which is generally found massive. Good pyritohedral and occasionally octahedral crystals have been found with rock crystals. Sometimes pyrite crystals have a black coating of filmy chalcocite so that at first glance they resemble sphalerite. Fine crystallized specimens have come from the Belmont mine.

Pyrolusite: Common in the oxidized zone of the manganese veins. Common also in the outcrops and its sooty black stains many of the great quartz reefs seen throughout the district. (Weed, p. 79).

Quartz: The most abundant mineral in veins in the Butte district. Drusy crystals very common. (Fluid inclusions are common in the quartz but are small and irregular in form. (Weed, p. 72).

Quartz, var.Amethystine: Small grains in rhyolite. (Weed, p. 44). Also found in pegmatites. (Gidel).

Quartz, var.Chalcedony: In masses of so-called silicified granite found about many of the vein outcrops. (Weed, p. 83). Occasionally found in veinlets in rhyolite. (Gidel).

Quartz, var.Milky: Fine crystallized specimens have been found in the silver veins of Walkerville.

Massive milky quartz is also present, sometimes banded with enargite, pyrite, sphalerite, rhodochrosite and rhodonite.

Quartz, var.Rock Crystals: Dainty little gemmy crystals occur grouped with pyrite and chalcopyrite. Little slender crystals occur as druses in cavities often associated with pyrite.

Quartz, var.Smoky: A nice group of smoky quartz crystals, in parallel growth, and all with a faint amethystine tinge, have been seen in pegmatites.

Rhodochrosite: Is common in the zinc and silver mines; also occasional occurrences in the copper veins. It is an ore of manganese in the Emma mine. Small druses of crystals are very plentiful in the Emma mine.

Coarse crystalline, pinkish, and often in large masses, rhodochrosite occurs as a vein filling in the mines of the district.

Rhodonite: Another common pinkish manganese mineral in the silver-zinc bearing veins of the district, especially common in the silver mines of Walkerville.

Small crystals rarely seen. Most abundant on the upper levels of the Alice, Moulton and Goldsmith mines.

Rutile: Needles and prisms of dark-brown rutile are common in the sericitized Butte quartz monzonite. They are most frequent where biotite is decomposing, but probably result from the alteration of titaniferous magnetite. (Weed, p. 83).

Sanadine: Small tabular grains in rhyolite. (Weed, p. 43).

Siderite: Occurs in some veins in the area north of Big Butte and Walkerville. (Gidel).

Silver: It was common in the silver veins and in the oxidized portions of the copper veins. It was silver mining which first brought fame to Butte as a mining camp. Native silver was found coating bornite and chalcocite in the copper veins and was much more abundant in the silver veins as wires and masses in vugs of quartz.

Occurs as wire silver, crystals and cubes (pseudomorphs after pyrite and galena).[7]

Sphalerite: A common mineral in the Butte district, but occurring to a less extent in the copper veins. The color is black to brown and it rarely occurs crystallized. Sphalerite is mined in large

7 Harter, R. F. H. Work cited, p. 79

quantity with galena in the Orphan Girl mine and with galena and rhodochrosite in the Emma mine.

Stephanite: A very common silver mineral in the Goldsmith, Amy Silversmith and other mines in the marginal area of Butte District. Large massive specimens were obtained from the Goldsmith and Amy Silversmith mines. The largest specimen seen in a collection of minerals from these mines weighed about 6½ lbs. and was about 75% stephanite. In this collection were a number of crystals, the largest, a tabular crystal from the Goldsmith mine, was 1½ x 1½ inches in size. Stephanite is commonly associated with chalcopyrite.

Stromeyerite: It occurs microscopically in the copper ore in one of the mines.

Tennantite: A common mineral in the copper veins but found in small amounts with enargite also in portions of veins grading to sphalerite. Fine, brilliant drusy crystals occur in the Anselmo, Steward, Mt. Con., Badger, High Ore, and Diamond mines.

Tenorite: This earthy black oxide of copper occurs sparingly at a number of localities in the southeast portion of the copper district.

Tenorite, var.Melaconite: Melaconite, the solid black oxide of copper, occurs in several southeastern localities in district. The mineral forms seams and small bunches in the altered surface rock. It is jet black, has a glistering conchoidal fracture resembling coal, and lacks crystalline form or texture. It occurs associated with cuprite, generally in seams or fracture planes or as coatings about noduels. (Weed, p. 82).

Tetrahedrite: (Gray copper ore) Found in the marginal silver-zinc belt. The bronze tetrahedrite of Weed's, (p. 78), occurring in the copper veins probably is the mineral now called colusite.

Thuringite: Pea-green, hydrous iron silicate mineral associated with chrysocolla in Butte Duluth, and Bullwhacker mines. (Gidel).

Tourmaline: Found in pegmatite. (Weed, p. 37).

Wad: Is the commonest of the manganese oxides present in the district, occurs usually disseminated through the vein quartz, mostly as an extremely finely divided powder arranged in curly, grotesque forms around crystals and along cracks. (Weed, p. 79). An oxidation product of rhodochrosite and rhodonite. (Gidel).

Wolframite: In small amounts associated with hubnerite in the Birdie mine, 3 miles east of Butte. (Gidel).

Wulfenite: Found in the Anaconda vein in little seams. (Weed, p. 85). Very rare in vugs.

Wurtzite: A rare mineral reported in the Gagnon mine, upper levels. In fine pyramidal crystals with sphalerite and quartz at the original Butte mine. (Dana p. 70).

Zircon: Noted as brown grains in quartz monzonite. (Weed, p. 32).

Harter[8] had reported the following minerals as occurring in the Butte District but Mr. Gidel states they are not known to be present. These minerals are anglesite, arsenopyrite, calaverite, columbite, franklinite, hausmannite, pyrrhotite, smithsonite, sylvanite, willemite, and zincite.

Any one planning to visit Butte should have no trouble in obtaining good massive specimens of chalcocite, bornite, enargite, chalcopyrite, pyrite, rhodochrosite, rhodonite, sphalerite, and galena; also good druses of rhodochrosite, enargite, and tennantite. There are many mine dumps in Butte but rarely are good specimens found on them. These dumps are high and dangerous and are made up mainly of decomposed granite, quartz, pyrite, and occasionally a specimen of copper ore.

At the Montana School of Mines, in Butte, the Clark and Pondorff collections of minerals are on display, also a good general collection, and in addition a fine display of mine models of the Butte District. (An excellent view of the city is to be had from the campus). At the offices of the Chamber of Commerce, arrangements can be made for a trip into the mines, also through the copper smelter at Anaconda. You will also be received with true Western hospitality by the members of the Montana Mineral and

8 Harter, R. F. H. Work cited, p. 82

A MINERAL TRIP TO NOVA SCOTIA

By GEORGE A. WILSON
Quincy, Mass.

Gem Club, if one of the members can be contacted.

In August of last year, the writer was privileged to visit some of the famous mineral localities of Nova Scotia. At first plans were made to visit known locations and then explore lesser known locations if time permitted. An old edition of Dana's supplied the names of some older deposits but these names are now obsolete. Even the natives have not heard of some of the places. It took the writer a long time to find Peter's Point, but finally, thanks to Professor Bancroft of Acadia University, it was found.

The following localities on the Bay of Fundy were visited: Partridge Island, the shore at Five Islands, Economy Mountain, Cape Blomidon, Scott's Bay, Harbourville, Canada Creek, Margaretville, East Margaretville, and Port George. (Several other points, Hall's Harbor, Victoria Harbor, Morden had been previously visited by the writer so they were omitted this year). In addition to the above localities, the following were also visited: New Ross, Chester Basin, Bang's Falls, Brookfield, Middlefield, Indian Path, Windsor and several others which had no mineral deposits worthy of notice.

Because of the extremely high tides and the steep cliffs along the shore, the trips to the Bay of Fundy had to be carefully planned. Anyone who contemplates a visit to this area should plan to have low tide or a falling tide. An average tide rises about one foot every ten minutes.

Partridge Island

The first location visited was Partridge Island, which is three miles south from Parrsboro. It is an excellent example of a tied island and it may be reached by automobile. Since it is easily accessible to the public, no attempt was made to collect here. However, the following minerals were noted: brownish stilbite crystals, small clear calcite crystals, and good chabazite crystals imbedded too deeply to be collected. The tide was too high to reach Wasson's Bluff, a few miles east of Parrsboro, but good heulandite and chabazite are found there.

Five Islands

The writer searched the shore at Five Islands but all of the minerals were too wave worn to collect. Chabazite, heulandite, analcite, and stilbite were noted. A boat trip to the islands would no doubt prove to be fruitful although Dr. George Van Ness Dearborn, of New York, who owns one or more of the islands, once told the writer that the best material was collected fifty years ago.

Economy Mountain

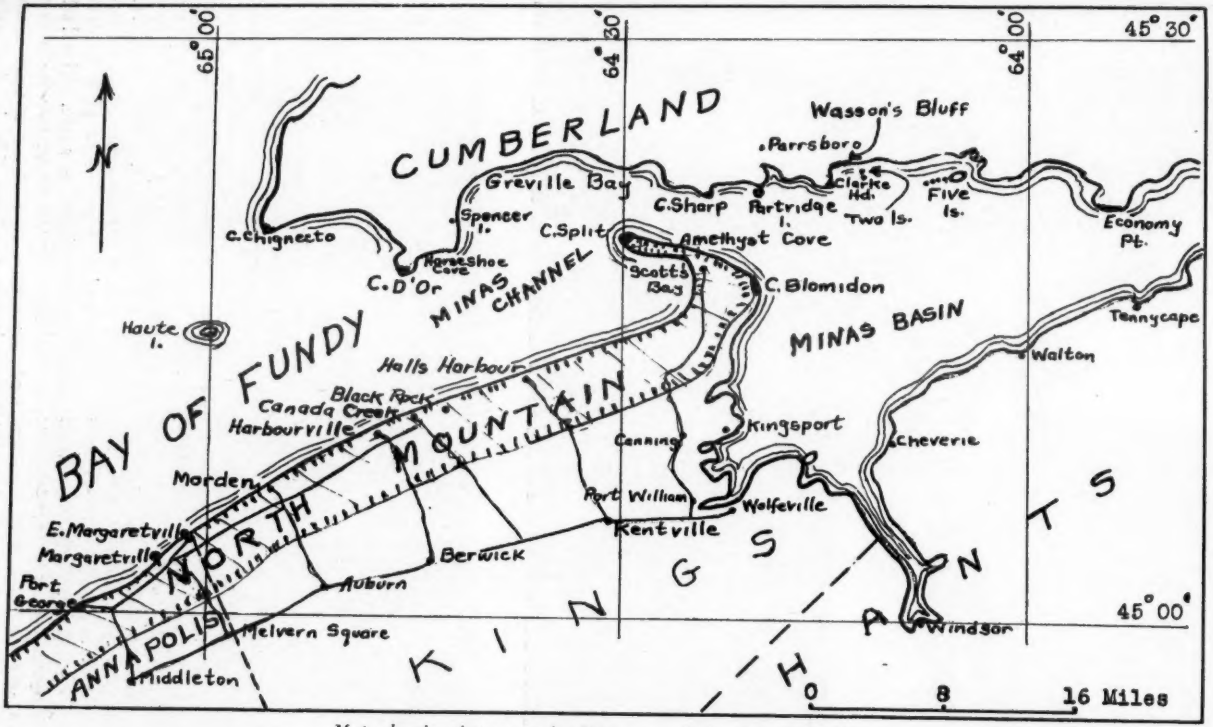
Economy Mountain, on Economy Point, was next visited and several specimens of amethyst and magnetite were found. Some of the magnetite was mixed with bornite. This is an iron mine which had been abandoned because the hematite in northeastern Nova Scotia is more superior. There is one main shaft and several test shafts or pits at the location which is at the verge of a steep hill leading down to the village at Economy Point. The mine has been abandoned for many years and the dump has been thoroughly combed by amethyst hunters.

Economy Mountain was formerly called Gerrish Mountain.

Cape Blomidon

Perhaps the most interesting side trip was the one which was made to Cape Blomidon. On the way a short stop was made at Scott's Bay where excellent agate and some large flawed amethysts were noted. The trap rock was too hard to work. The hike or climb over the four hundred foot cliff was hazardous. The precipitous descent of the Bay of Fundy side was difficult because of a recent rain storm. It was necessary to travel along piles of talus until the tide receded. Finally mineralized amygdules were observed and collecting really began.

The analcite occurrence looked promising when first approached. In fact it produced the "collector's thrill" to see the



Map showing important localities around the Bay of Fundy.
(Topography is from the Canadian Dept. of Mines and Resources, Nova Scotia Sheet, Map 39A, Second Edition)
(Roads shown are not to scale)

Harbourville, N. S.
A typical shore line from Cape Blomidon to Digby, N. S.

transparent trapezohedrons but as soon as the hammer was brought into use, it became apparent that the crystals could not be collected in quantity. Blasting would be required to secure good material. The analcite was confined to a layer five or six feet wide and about forty feet long.

Amethyst Cove

The famous Amethyst Cove contained little or no amethyst. At various locations along the shore, a number of minerals were observed but most of them were too wave worn to collect. At one place there was a mixture of stilbite and green apophyllite. At another chabazite was noted in one-inch crystals. Agate was plentiful everywhere. Magnetite was abundant at one place and hematite coated the basalt at another. Unfortunately, some amethyst hunter had broken every light colored mineral within reach of a hammer. After "trudging" back over the cliff it was decided that Cape Blomidon is better as a geological feature than as a mineral location.

Harbourville

Harbourville was next visited and the shore line yielded several mineralized zones which produced abundant white, brown and orange laumontite; excellent stilbite; excellent heulandite, both creamy and flesh colored; several perfect 1¼-inch apophyllite crystals; a few excellent golden calcite crystals, one of them imbedded and intergrown in pink heulandite; and considerable agate. The best material was found about two miles east of the wharf and about a mile from Canada Creek. Low tide is absolutely necessary to make this trip.

Other Localities

At Peter's Point, or better, at East Margaretville near Stronach Brook, laumontite was plentiful but pulverulent due to exposure. Stilbite and weathered apophyllite were common. Fine radiated stilbite was found at a few places. Large white individual analcite crystals were also collected. At Margaretville, laumontite and stilbite were common.

At Port George, stilbite crystals and some fine radiated stilbite were collected. The radiated mineral looks like natrolite, but Dr. Berman of Harvard University said it was stilbite.

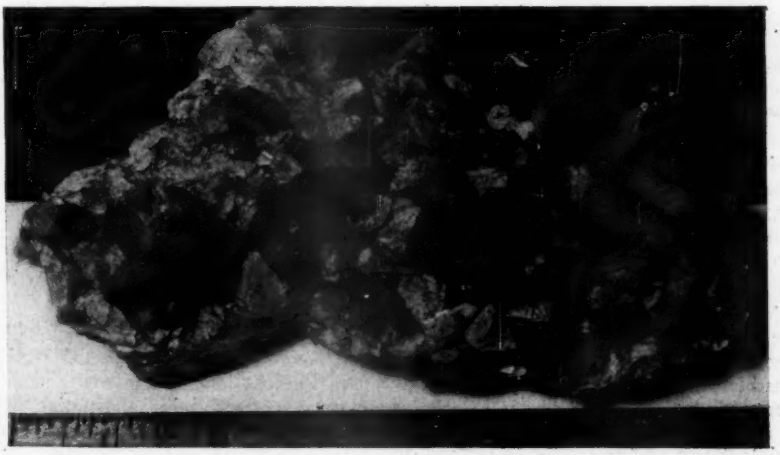
The map which accompanies this article shows the best roads across the North Mountain. Persons planning to visit the localities should be able to get a few good specimens from most of them provided there have been some fresh falls during the spring. In every case, a hike along a mile or more of slippery rocks should be anticipated.

At Windsor, a short trip was made to the gypsum deposits but no minerals were collected as visitors are not allowed in the quarries during working hours owing to the danger from blasting. At Chester Basin, the gold mine was visited but no minerals were found which were worth collecting. This is probably true of most

Radiated Stilbite
Harbourville, N. S.

Nova Scotian gold mines. A hike up Gold River netted nothing but exercise. At New Ross, there is an abandoned tin mine, and the dump contains some pieces of massive smoky quartz. The manganese mine off Mill Road has not been worked for several years but plenty of pyrolusite and calcite may be collected if one has a guide and is willing to travel about four miles through the woods. The writer visited the mine four years ago.

At Indian Path, near Lunenburg and near the famous "Ovens," the tungsten mine is operating. The ore is massive



Stilbite and Apophyllite
East Margaretville, N. S.

cream colored scheelite. The dump produced good pyrrhotite, excellent arsenopyrite crystals, good pyrite and chalcopyrite. The mine is operating on a small scale and concentrates are being prepared on the premises.

At Bang's Falls and Middlefield, a goodly number of one-half inch pyrite cubes were extracted from the slate rock. At Brookfield, the gold mine was operating but no specimens were collected. Numerous other locations could have been visited, but the writer had limited time.

In conclusion, the writer would like to assure all readers that the Canadian people are not interfering in anyway with United States citizens. The only restrictions are confined to military zones and strategic airports, harbors, etc. In fact, a trip to Nova Scotia is recommended at this time because the local people have less time to devote to mineral collecting.

COAL CARVING

By ERIC L. ARMSTRONG, L. N. C. M.

(Cert. Mine Manager)

Ever since man first discovered that a sharp flint could be used to scrape down a pole, and thereby make a serviceable spear as a weapon for both defence and offence, he has by turns become a sculptor, carver and artist.

Pictures found in ancient caves, monuments in stone and metal, and carvings on bones, the softer rocks, and on early weapons and ornaments testify to early man having an eye for the artistic.

The pigments used for painting ancient pictures were mineral oxides, with oil or fats for a binder. The mediums for early sculptors were the softer rocks, wood, and bones.

Discovering the use of iron and steel with which to make more durable tools, man attacked the harder and more lasting rocks to make monuments that would testify to his ability, prowess and often to his vanity.

And even today, many find it both a pleasure and a profit to carve and sculpt or to paint. We find them using many mediums, wood, slate, alabaster, coral, marble, and even coal. It is with the latter medium I am about to deal.

The first requirement is a block of coal without any fractures. Due to the use of explosives in mining it is difficult to find such blocks, but careful selection may discover one suitable for small objects. If one has access to a mine, it is possible to get a large block cut out by the hand pick that will be without objectionable fractures.

The second requirement is good sharp tools, for very light cuts "must" be taken or the work will be spoiled. The chisels and gouges used by wood carvers are excellent for this work; but "keep them razor sharp".

The third requirement is the "artist eye and hand", for if you cannot see the "angel in the stone" before you commence cutting, you may be found using language quite unangelic later on.

Coal may be sawn with a fine toothed ordinary carpenter saw, or with a hack saw. Care must be taken not to attempt forcing a cut or a fracture of the block will result. Curves may be cut with a small coping or fretwork saw but again care must be taken not to let the saw bind by forcing it.

Rough parts may be removed with a half-pound rasp such as wood workers use. Use medium to fine emery cloth to secure the finer finish. Soft pine shavings or woolen cloth is the best to get a polish. A coat of shellac will protect the finished work against absorbing moisture and crumbling apart.

The whole secret of good work is that of taking time and care. Hurried work is always a failure.

I find drillers here use a cement for casing holes that sets hard yet is soft enough to be worked after setting. It is chalk white.

There are three kinds of coal found in the United States and Canada suitable for carving. The best is Cannel Coal. This will take a polish like a newly cleaned stove, if woolen rags are used for finishing off. The second best is anthracite. This is used by commercial carvers, and the lady who presides over my home has a necklace of beads, with a pendant studded with "sulphur diamonds"—a form of pyrite found in coal seams. It is absolutely clean, like jet; and the owner is envied by many for her novel necklace.

The third variety is bituminous coal, and this wants careful handling. It is more highly laminated, and if care is taken—as with wood—to show the grain to the best advantage, a nice job can be done with it.

There is a mine at Thorburn, Nova Scotia, Canada, at which an engine was used below ground for rope haulage. The attendant used his idle moments to do some carving on the walls of the engine room which were of solid coal. A "lion", and a bust of "King Edward" resulted. The mine closed down, to be reopened some twenty years later. The first thought of those in the know was about the carvings which had been left in the mine. When dewatered, it was found the lion had disintegrated, but the bust was well preserved and there was talk of having it taken out for a local museum.

This coal is bituminous, highly laminated, somewhat hard and blocky. That the bust should survive the action of mine water for many years is sufficient tribute to the lasting qualities of coal as a medium for carving.

I would recommend the beginner not to be too ambitious, but to confine his efforts to small articles till a technique is acquired. When the winter's coal arrives, many pieces may be selected which may be converted into inkwells, busts, figures of animals and birds, ash trays, and other trifles. Anything that may be carved from other material may be cut from coal.

It is fitting to mention I carved a *"Venus"* from a block of Cannel coal, which not only took a prize at an exhibition, but sold for a nice fistfull of money; which is a good thing to have too much of. (I haven't). This figure stood 24 inches high, the circular base and figure being one solid piece. The amusing part to me is: that my customer for the Venus was a highly respected clergyman. (Did he drape the lady?)

One thing should be borne in mind: when you have succeeded in turning out something worth keeping, give it a coat of shellac. Many coals have a "lime content", and will absorb moisture, to disintegrate entirely later.

In a district where cannel local is plentiful, the homes of the miners are filled with objects carved from coal. Among them I have seen pigs with a hole in the back to place matches, horses, cows, boats, flowers, platters, jugs, and countless other articles. Visitors see these things displayed in the windows of the homes, and many is the dollar left behind in exchange for a novelty carved in coal.

A Letter to the Editor

Philadelphia, Pa.:—I feel like checking in my 2 cents worth, re: buying specimens vs. your own collecting.

It is cheaper to buy fish at the market, and you get bigger and better ones, too, but who would compare a bought fish with one you caught yourself? A bought specimen simply represents the power of the dollar. Any numskull with the price can buy the best minerals in the world but what does he get out of it? As for me I would rather have my "railroad ballast' than the finest "bought" collection in the world—Alfred S. Edmunds.

BIBLIOGRAPHICAL NOTES

The American Mineral Guide

Here is a publication that was prepared especially for mineral collectors. It is divided into three sections as follows: Section 1—The American Mineral Guide to Notable Collecting Areas, pp. 1-28; Section II—Directory of American Mineral and Gem Collectors and Collections, pp. 29-66; Section III—Dealers' Section, listing those substantial firms supplying the needs of the mineralogist, pp. 67-96.

Collectors who may be planning long trips should find this Guide of great value and interest as the first two sections are listed alphabetically under their respective states. The compiler, Hugh Brown, has done a good job and he is to be congratulated.

Published by the Western Mineral Exchange, 322 Madison St., Seattle, Wash. Price $1.00 a copy.

Report of the State Geologist on the Mineral Industries of Vermont, 1939-1940.

The report covers asbestos, clay, brick, granite, limestone, marble, mica, slate, talc, soapstone, jasper, sand and gravel. 67 pp., 7 illus.

Issued by the Vermont Geological Survey, Burlington, Vt.

Reconnaissance of Gold-Mining Districts in the Black Hills, S. Dakota

By Paul T. Allsman.

The paper is one of a series on the mineral resources of South Dakota, being published by the Bureau of Mines.

Issued by the U. S. Bureau of Mines, Washington, D. C., as Bull. 427, 146 pp., 32 illus.

Dinotocrinus, a New Fossil Inadunate Crinoid Genus. By Edwin Kirk.

This new crinoid genus comes from the lower Chester group of Alabama and the Chester of Illinois (Mississippian). 3 p., 1 pl., Pub. No. 3103.

A supposed jellyfish from the Pre-Cambrian of the Grand Canyon. By R. S. Bassler

The search for fossils in pre-Cambrian rocks have always intrigued geologists because very few discoveries have been found in them; consequently this paper is of more than passing interest. 3 pp. 1 pl., Pub. No. 3104.

Both reports have been issued by the U. S. National Museum, Washington, D. C.

Summer 1941 *Schedule of the Woodland Trail Walkers.*

Ernest A. Dench, Director of the Woodland Trail Walkers, Ho-Ho-Kus, N. J., has compiled a most interesting schedule covering hikes in a number of states as New Jersey, New York, Connecticut, Rhode Island, and Maine. As the hikes frequently include visits to mineral localities—mines and quarries—we are sure that many of our readers will be interested in them. Send Mr. Dench 10c as payment for his schedule (50 pages); possibly one of the trips may be held in your vicinity.

The Mining Industry of the Province of Quebec for the Year 1939.

By A. O. Dufresne, Director.

The report covers metallic and non-metallic ores and minerals which were produced in 1939. A 26-page list of the principal operators and owners of mines and quarries in the province is included. 132 pp., 4 pls.

West Part of Vanquelin Township, Abitibi County, Que.

By Carl Tolman.

During 1938, the west half of the township was geologically mapped and the mineral deposits of the area studied; the report covers this work. 23 pp., 2 figs., 3 maps.

Both of the above reports are issued by the Bureau of Mines, Quebec, Que., Canada.

CALIFORNIA MINERAL PRODUCTION

State Mineralogist, Walter W. Bradley, announces that Bulletin No. 119 of the Division of Mines, of the Department of Natural Resources is just off the press and ready for distribution. The title of Bulletin No. 119 is CALIFORNIA MINERAL PRODUCTION AND DIRECTORY OF MINERAL PRODUCERS FOR 1939. This bulletin is one of the series of annual statistical reports which have been issued for many years. It contains detailed data covering the amount and value of metallic and non-metallic minerals, sub-divided as to fuels, metals, structural materials, industrial materials and salines, both by substances and by counties together with various charts and graphs. A directory of all producers (except for natural gas and petroleum) which adds much to its value is also included. The properties and uses of the more than sixty mineral substances produced are treated briefly, the whole comprising a condensed compendium of information on the commercial minerals of the State. With each mineral substance there is a table giving total recorded annual production, and many with a short historical outline.

Bulletin No. 119 contains 223 pages, and 9 figures, and is bound in paper cover. It may be purchased from the California State Division of Mines, Ferry Building, San Francisco, for 80 cents plus 2 cents sales tax for California residents. It may also be obtained from the offices of the Division at: State Office Bldg., Sacramento; State Bldg., 217 West First St., Los Angeles.

NEW ENGLAND NOTES

Conducted by RUDOLF C. B. BARTSCH

36 Harrison St., Brookline, Mass.

Quincy, Mass. Most of the granite quarries here are filled with water and the grout piles are gradually being pulled down and broken up for foundation material. Local collectors are continually watching these operations with the hope that they may be lucky enough to find some of the famous crocidolite from the old Fallon quarry. Recently we were fortunate in locating some blocks of granite that must have been on the edge of the cavity in which the interesting material was found many years ago. Excellent specimens of green aegirite with parallel growth of dark blue riebeckite were secured. One very fine crystal of aegirite was added to our collection. In the cavities long black needles of the 2nd deposition of riebeckite were quite plentiful with purple fluorite xls, ilmenite xls, and some galena. We hoped to find some parisite xls but were disappointed. However some more blocks have been located which show signs of being interesting. Some very fine clear xls of smoky quartz were recently found by shifting debris on dump. Galena, smoky quartz xls and purple fluorite are not hard to find but difficult to secure in good specimens. Crocidolite can be found, in thin veins in seams in the granite, up to ⅓ inch in thickness. The Schwingel quarry at West Quincy is the best place for this mineral.

Grafton, N. H. A recent visit to this famous old mine resulted in adding much fine material to our collection. The work at the present time is producing a great deal of interesting material for the collector. Superb specimens with autunite are very plentiful as well as uranophane. There is more than the usual amount of gummite to be found. Many so-called fluorescent "eyes" are scattered over the dumps. The center is gummite, then uranophane, and finally autunite. The gummite does not respond to violet rays but gives a dark center with the surrounding green of autunite. These "eyes" show a fairly even radiation from the center. Torbernite has been found each year but rather sparingly. Now it is fairly plentiful in crystals of siskin green and bright emerald green. Cyrtolite is quite plentful, particularly in the apatite, but this mineral is not quite as common as usual. The montmorillonite seems to be in better quality at present. The color is much pinker and when fresh is very soft and waxy. On drying it becomes quite hard and can be handled much better than the material we had previously found. Some fair beryl specimens were seen on the dumps. No quartz in crystal form was observed. And now just a reminder—if you wish to collect at the Grafton mine be sure to secure, first, a pass from the Whitehall Co., Inc., Keene, N. H. This pass will permit you to inspect the mine and also to collect mineral specimens of interest. *Do not forget to include a stamped, self-addressed envelope when writing for the pass.*

Massachusettes Mineral Localities. Our plea for Massachusetts data from collectors has brought practically no response, in fact only two collectors have answered. It would seem that there is but little interest in producing such a book and unless a stronger and more active interest in shown in the near future it is doubtful if any further work will be done on the subject. It could and would be a valuable book for collecting in Massachusetts, and we want to make it so but we must have your help. How about it?

Club and Society Notes

Canon City Geology Club

Affiliating with the 9th National Outing of the Rocks and Minerals Association, the Canon City Geology Club, (Canon City, Colo.), of thirty members and friends spent May 18th in the field. One group, conducted by Mr. Rice, went by motor truck, and horseback to the foot of the Greenhorn Mountains where they camped Saturday night under a large white fir tree estimated at 75 feet in height and 4 feet through. F. C. Kessler, the Secretary of the Club, spent the night with this group but left camp early, at 5:30 a.m. in fact, to join another section of the Club that was scheduled to leave town at 8:00 a.m.

This group visited the dinosaur excavation in Garden Park, toured Red Canons and the Skyline Drive. From the Skyline Drive, four geological periods with their entire series of formation can be studied in cross section, since they occur in upturned edges known as hogbacks.

Dr. Newsam, Prof. Rockwell. Prof. Ada Kensgen, ad others of Gunnison, Colorado, crossed the Continental Divide over Monarch Pass and camped in Canon City Saturday night to join the party. The Bradshaw Terrazzo Works and the Colona Travertine Marble Quarry were feature attractions for this group.

F. C. Kessler

Bridgeport Mineral Club

The 3rd field trip of the club will be held on Sunday, July 27th, to the barite mines of Cheshire, Conn. A large turnout of members is expected at this noted locality. For further particulars contact Mrs. Julia Walker Sec., 55 Eaton St., Bridgeport, Conn.

New Haven Mineral Club

The 4th field trip of the club will be held on Sunday, July 20th, to the quartz crystal locality at Stafford Springs, Conn. The group will meet in front of the Peabody Museum on Whitney Ave., New Haven, Conn., at 9:00 a.m., D.S.T., from which point it will proceed to the locality.

Queens Mineral Society

The new officers of the society are Arthur H. Jones, (Brooklyn), President; Wm. J. Hanifin (Richmond Hill), Vice-President; and Mrs. Edward J. Marcin (Flushing), Secretary-Treasurer. Members of this very active New York club are frequently seen at mineral localities.

Rocks and Minerals Association

The 9th National Outing of the Association held Sunday, May 18, at the pegmatite quarries near Portland, Conn., was a grand success with about 200 collectors participating. The Andrews, Schoonmaker and Strickland quarries were visited and many interesting finds—some outstanding—were found. The most interesting specimens found were pink beryl (morganite) and crystallized purple apatite, both from the Strickland Quarry. Mr. A. J. Slater, of Waterbury, Conn., found the best apatite specimen.

Northern Ohio Guild

Members of the Northern Ohio Guild of the American Gem Society re-elected the entire executive board for a second term on the evening of Monday, June 2nd, in Pierce Hall of Western Reserve University—Cleveland.

Officers are:

Charles Carolyne of the Brenner Co., Youngstown, President

Raymond Hoover of Hood & Hoover, Akron, Vice-President

William Theis of the Webb C. Ball Co., Cleveland, Secretary

V. E. Chittenden of the W. J. Frank Co., Akron, Treasurer

This Guild has shown rapid growth during the past year under the leadership of Mr. Carolyne and because of the excellent work of Dr. Henry Donner, Professor of Geography and Geology of the University, who has done an outstanding piece of work in orienting the written assignments of the courses with lectures and practical work in the laboratory thereby increasing the value of the instruction to old as well as new students.

The next meeting of this Guild will take place on the first Monday evening in October.

Harold P. Crosby

Nov. 25, 1886-May 14, 1941

Mineralogical circles in New England were deeply shocked by the sudden death of Harold P. Crosby who passed away on the night of May 14, 1941. Mr. Crosby was President of the Mineralogical Club of Hartford. He presided at the club's meeting on May 14th which was held at the clubrooms at 249 High St., Hartford, Conn. He dropped dead soon after the close of the meeting and while still in the building.

Mr. Crosby was born on Nov. 25, 1886, in Southbridge, Mass. He was graduated in 1909 with a degree of Bachelor of Science from Massachusetts State College; he also studied at Yale University and the University of Vermont. At the time of his death, Mr. Crosby was a teacher of biology and general science at the Hartford High School. Burial was in Hyde Park, Vermont.

COLLECTOR'S KINKS

ATTACHING LABELS TO SPECIMENS

From time to time many a collector is given some old specimens by a friend. Very often these specimens have no labels but if labels are present many often do not correspond with their accompanying specimens. What a relief when a label is attached to a specimen!

We have long been advocates of labels being attached to specimens. Unfortunately the adhesives which have been on the market for the past few years do not seem to work well with minerals—the labels would fall off. Either the adhesive used 50 or more years ago was better or else the old collectors knew more about affixing labels to minerals than we do today.

Mr. O. Ivan Lee, of Jersey City, N. J., is one of the most persistent believers in labels being attached to specimens that we know of in America. His labels are so uniform in size, printing and format that once seen they can be recognized anywhere. The label that he uses measures only ½x¾ inches in size. A letter from Mr. Lee gives us this information:

"None of my labels are loose and none contain my name but only the name of the species (formula and amount of chief constituent if space permits) and precise locality. If radioactive, a red "R" is added. All are printed by hand with a fine pointed fountain pen under a stereobinocular microscope and after affixing to an inconspicuous area on the specimen, is lacquered three times. It's considerable trouble but only has to be done once. No labels are ever lost!"

Government Seeks Mineral Economists

Mineral resources are of the utmost importance to National Defense. In this connection the Government is looking for persons especially qualified in the economic aspects of the mineral industries to do professional research in the fields of minerals, coal, and petroleum. Civil service examinations for these positions are now open. The salaries range from $2,600 to $5,600 a year. Applications will be rated as received at the Commission's Washington Office but interested persons are urged to file their applications at once.

Completion of a 4-year college course with major study in such subjects as geology, metallurgy, mining engineering, economics, or political science, is required. However, persons who have had only 2 years of the college study may substitute 2 years of experience dealing with economic aspects of the mineral industries. In addition, all applicants must have had progressive professional experience dealing with the economics of mineral industries. At least some of this experience must have been in research in either metallic minerals, non-metallic minerals, secondary metallic minerals, coal, petroleum, or general mineral economics. Graduate study in mineral economics or in a combination of mineral economics and general economics may be substituted in varying degrees, for the experience required.

Mineral economists will plan or conduct professional research in mineral economics dealing with the conservation, utilization, extraction, refinement, marketing, consumption, and foreign and domestic sources, of minerals. This will include the evaluation and interpretation of basic data and the preparation of the results for use or publication, as the case might be. Applicants will not have to take a written test, but they are required to submit a list of whatever writings they have done in the field of mineral economics, and if possible, to submit a copy of at least one research project.

Further information, including the exact education, experience, and substitution provisions, is contained in the formal announcement. Announcements and applications forms may be obtained from any first- or second-class post office or from the Civil Service Commission, Washington, D. C.

Clubs Affiliated With the Rocks and Minerals Association

ARIZONA

Mineralogical Society of Arizona
Geo. G. McKhann, Sec., 909 E. Willetta Street, Phoenix.
Meets at the Arizona Museum in Phoenix on the 1st and 3rd Thursday of each month.

CALIFORNIA

East Bay Mineral Society
Miss Marjory Welch, Sec., 3268 Central Avenue, Alameda.
Meets on the 1st and 3rd Thursdays of each month (except July and August), at 8:00 p.m., in the Lincoln School Auditorium, 11th and Jackson Sts., Oakland.

Northern California Mineral Society
A. L. Rogers, Sec., 137½ Joost Ave., San Francisco.
Meets on the 3rd Wednesday of the month at the Public Library in San Francisco.

Southwest Mineralogists
Mrs. Pearle Arnold, Cor. Sec., 2132 W. 76th St., Los Angeles.
Meets every Friday at 8:00 p.m. at Manchester Playground, 88th and Hoover Sts., Los Angeles.

COLORADO

Canon City Geology Club
F. C. Kessler, Sec., 1020 Macon Ave., Canon City.
Meets on the 1st and 2nd Saturdays of each month at 9:00 a.m. in the High School Building, Canon City.

Colorado Springs Mineralogical Society
Lynn M. Hopple, Sec.-Treas., Motor Route 2, Colorado Springs.

CONNECTICUUT

Bridgeport Mineral Club
Mrs. Julia Walker, Sec., 55 Eaton Street, Bridgeport.
Meets in the Bridgeport Public Library on the 3rd Monday of the month.

Long Hill Mineral Club
Eugene F. Robinson, Sec., R. F. D. No. 4, Box 237, Bridgeport.
Meets on the 4th Tuesday of each month at 8:00 p.m., in the Hawley Memorial Library, Long Hill.

Mineralogical Club of Hartford
Mrs. L. T. Goodrich, Sec., 51 Jerome Avenue, Bloomfield.
Meets the 2nd Wednesdays of each month, at 8:00 p.m., at 249 High St., Hartford.

New Haven Mineral Club
Mrs. Lillian M. Otersen, Sec., 16 Grove Place, West Haven.
Meets on the 2nd Monday of the month at the Y. W. C. A. on Howe St., New Haven.

IDAHO—OREGON

Snake River Gem Club
Margaret L. Hearn, Sec., Payette, Idaho.
Meets alternately in Payette and Ontario, Oregon, (two small cities on the Snake River) on the 3rd Tuesday of every month.

ILLINOIS

Junior Mineral League
E. Johansen, Sec., Morgan Park Junior College, 2153 W. 111th St., Chicago.

MAINE

Maine Mineralogical and Geological Society
Miss Jessie L. Beach, Sec., 6 Allen Avenue, Portland.
Meets last Friday of the month at 8 p.m., at the Northeastern Business College, 97 Danforth Street, Portland.

MARYLAND

Natural History Society of Maryland
2103 N. Bolton Street, Baltimore.
Office hours, Tuesdays and Fridays, 10:00 a.m. to 5:00 p.m.

MISSOURI

National Geologist Club
Mrs. D. P. Stockwell, Pres., Mt. Olympus, Kimmswick.

NEVADA

Reno Rocks and Minerals Study Club
Mrs. Rader L. Thompson, Sec., R. F. D. 1, Box 225-A, Reno.
Meets on the 1st Wednesday of each month, at 7:30 p.m., at the Mackay School of Mines, Reno.

Western Nevada Mineral Society
A. Cornely, Sec.-Treas., P. O. Box 21764, Reno.
Meets usually at the Lennox House, Colorado College Campus, Colorado Springs, on the 2nd Monday of each month at 7:30 p.m.

NEW JERSEY

Newark Mineralogical Society
William E. Simpson, Sec., 308 Grove Street, Montclair.
Meets on the 2nd Sunday of the month at 3 p.m. at Junior Hall, corner Orange and North 6th Streets, Newark.

Plainfield Mineralogical Society
Joseph D'Agostino, Sec.-Treas., 711 Sheridan Avenue, Plainfield.
Meets on the 1st Tuesday of the month at 8 p.m. at the Plainfield Public Library.

NEW MEXICO

New Mexico Mineral Society
R. M. Burnet, Sec.-Treas., Carlsbad.

Society of Archaeology, History and Art
Carlsbad.

NEW YORK

Chislers, The
Miss Evelyn Waite, Sponsor, 242 Scarsdale Road, Crestwood, Tuckahoe.
Meets bi-monthly at members' homes.

Queens Mineral Society
Mrs. Edward J. Marcin, Sec., 46-30—190th Street, Flushing.
Meets on the 2nd Thursday of the month at 8 p.m. at 289 Etna Street, Brooklyn.

OKLAHOMA

Oklahoma Society of Earth Sciences
W. P. Smiley, Sec.-Treas., 229 W. Jefferson Street, Mangum.
Meets on the 2nd Tuesday of each month, at 7:30 p.m., at the Historical Museum, Mangum.

PENNSYLVANIA

Thomas Rock and Mineral Club
Mrs. W. Hersey Thomas, Pres., 145 East Gorgas Lane, Mt. Airy, Philadelphia.
Meets on the 3rd Friday of each month, at 8:00 p.m., at the home of its president, Mrs. Thomas.

VERMONT

Mineralogical Society of Springfield
Victor T. Johnson, Sec., 11 Elm Terrace, Springfield.
Meets on the 3rd Wednesday of each month at 8:00 p.m. at the homes of members.

WASHINGTON

Gem Collectors Club
Mrs. Llyod L. Roberson, Sec., 522 North 70th Street, Seattle.
Meets on the 1st and 3rd Tuesday of each month (except during the summer) at 8:00 p.m., at the Y. M. C. A.

Washington Agate and Mineral Society
Monroe Burnett, Sec., 802 S. Central St., Olympia.
Meets on the 1st Monday of the month, at 7:30 p.m. at the home of some member.

. . . Collectors' Tales . . .

By Peter Zodac

THE HERETIC

While prospecting for iron ore in the South Branch Mountains, near Moorefield, Hardy Co., W. Va.,in the summer of 1929, we had in our party of seven a mineralogist from Cleveland, Ohio, who was a very fluent conversationalist in geological science. We had cautioned him to cut down on his "millions of years ago" talk while among these pious mountain folk because they really believed that the world was made in seven days of 24 hours each. We had learned in previous experiences that some people do not care to be enlightened.

In prospecting, we found that a rich ore deposit was on a farm lying east of and adjoining our options. We decided to interview the owner about securing the mineral rights on this farm. Someone in the party suggested that we might also buy our lunch from the farmer. We all thought it a very good idea so we threw in a dollar apiece and waited hungrily for the call to lunch.

We found the walls of the dining room practically covered with framed verses from the Bible and pictures of the Saints. The farmer prayed for the blessing in an eloquent and fervent manner. He was indeed a very religious man.

We were all doing justice to the food until our mineralogist friend broke loose with his "millions of years ago" orations. We tramped his foot, hoping that he would remember the warning we had given him, but we were too late. The damage was done. The farmer arose from the head of the table, and ordering the youth of his family to leave the room, he then pointed directly at me saying, "You have brought a Devil Man among us!"

We hastened to apologize by saying that our friend, the mineralogist, was a person of great learning but without the old-time religion. Needless to say, the meal was finished in a discussion of the present state of the weather and we put off trying to secure the option until a more favorable time.

—WALTER S. AMOS.

WITH OUR DEALERS

On June 30, 1941, John A. Grenzig of Brooklyn, N. Y., reached his 78th birthday. Congratulations, Mr. Grenzig!

A unique mineralogical paper is *The Great American Trade Rat,* published by "Rocky" Moore, 401 Broadway, Arcade Bldg., 542 South Broadway, Los Angeles, Calif. It is a small newspaper in format and full of interesting mineralogical news items—tall stories, minerals for sale (good buys, too), exchange ads., etc. Another publication is "Rocky's" *Ready Reference on Mining Terms, Minerals, etc.*—it is a scream!

Rush "Rocky" your name and address for copies of these two very interesting and very unique publications. You'll never regret it!

Wyoming Minerals, Box 266, Laramie, Wyo,, have just issued an interesting little 16-page catalog entitled "Mineral Specimens of Quality." The catalog features a large number of minerals including cut stones and rough material suitable for polishing. One of the features of the catalog is the list of petrified woods (identified) which the firm carries in stock. The catalog has an attractive illustrated cover. If you are not on this firm's mailing list, rush in your name and address for a copy of the catalog.

The May, 1941, number of *Ward's Natural Science Bulletin,* issued by Ward's Natural Science Est., Inc., 298 Goodman St., North Rochester, N. Y., is a most interesting publication. On the very first page it states that the very first number of the *Bulletin* was issued on June 1, 1881, as the first periodical of its kind in the United States. Pages 2 to 3 are devoted to the history of the Establishment —founded in 1862 by Prof. Henry A. Ward; the staff now number 45. In the excellent photo on page 4, we recognize easily Dr. D. L. Gamble, President of the Establishment and Mr. Robert C. Vance, Head of the Mineral Department. On pages 17-18, Mr. Vance is introduced to the readers of the *Bulletin* under the heading "Men behind the scenes at Ward's." A very fine photo of Mr. Vance appears on page 17.

The Ultra Violet Products, Inc., 5205 Santa Monica Blvd., Pasadena, Calif., have issued an attractive 4-page folder featuring their wide range of ultra violet lamps under the trade name "Mineralight." An intensely interesting 2-page article, "White Magic with Black Light", by the President of the company, Thomas S. Warren, and a partial list of fluorescent minerals accompany the folder.

NEWARK MUSEUM EXHIBITION

A survey of the mineral kiugdom is offered in an exhibition on view in the science gallery of the Newark Museum this summer. Comprising more than 400 specimens from the Museum's collection, representing about 360 species, it is the most comprehensive mineral display held at the institution in several years.

Differing from recent mineral shows at the Museum, the new exhibit is designed primarily to interest the mineralogist and student. The specimens are arranged according to chemical structure, starting with elements such as graphite, gold and silver, and running the gamut of mineral classification from sulphides to silicates.

As a special feature of the exhibition specimens of metals are shown when possible with the minerals from which they are most commonly obtained. Thus a piece of lead is arranged beside the galena from which it is extracted, a piece of nickel with a specimen of pyrrhotite, and aluminum with bauxite.

A local angle is given to the display by the inclusion of many New Jersey minerals, notably specimens of franklinite, willemite, zincite and other species which have made the State famous in the mineral world.

Items of popular interest include a glass model of the Jonker diamond, given to the Museum by Harry Winston who owned the gem at one time, and nuggets of native gold from Colorado and Venezuela.

The exhibit will continue through July and August.